

# A Tale of Two Organisms

by Dennis Teague and  
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*The Florida perforate lichen, an endangered species, was first found growing on the sand dunes at Eglin Air Force Base, Florida*

*Photos by Douglas Ripley/U.S. Air Force*

The 464,000 acres (188,000 hectares) of Eglin Air Force Base, located on the Gulf of Mexico along Florida's northwest coast, provide habitat for a diverse range of critical species. Perhaps none of Eglin's 11 threatened or endangered species is more interesting from both historical and biological perspectives as the Florida perforate lichen (*Cladonia perforata*). In 1993, *Cladonia perforata* had the distinction of being the first lichen to be placed on the federal endangered species list.

Lichens are largely terrestrial organisms formed by a mutual association between two totally separate organisms, usually an alga and a fungus. Approximately 3,800 species of lichen have been recognized in the United States, but only two currently are protected under the Endangered Species Act.

*Cladonia perforata* was discovered growing on the sand dunes of Eglin AFB by George Llano, an airman serving at the base during World War II. It was later found at several other Florida populations on the Atlantic coast and on the Lake Wales Ridge of central Florida. The exact location of the Eglin AFB population was lost for many years until it was rediscovered in 1989 by botanists Dr. Gerould S. Wilhelm and Dr. James R. Burkhalter. After the rediscovery, the Florida Natural Areas Inventory (FNAI) surveyed the area to determine the size and natural boundaries of the population. The FNAI also discovered two small, previously unknown fragmentary populations several miles west of the main population. Subsequent biological inventories by the FNAI at Eglin AFB have played a very important role in helping the Air Force manage the natural resources entrusted to its care.

All *Cladonia perforata* habitats are subject to significant natural disturbance from high intensity fires or hurricanes. The vulnerability of the small populations to such disturbances, coupled with the loss of potential habitat due to development, were important factors in the listing of this species as endangered. The Eglin AFB population suffered a major setback in 1995 when the extremely high winds and storm surges of Hurricane Opal struck the Gulf Coast at Santa Rosa Island. Two of the three populations at Eglin AFB were destroyed and the largest was reduced by over 70 percent. With Air Force support, researchers Rebecca Yahr (who at the time was with the Archbold Biological Station in Lake Placid, Florida) and Paula DePriest (of the Smithsonian Institution's National Museum of Natural History) began a series of small-scale experimental reintroductions of the lichen to characterize the best transplantation sites and protocols.

At first, DePriest and Yahr found that reintroducing the lichen into former habitat was an extremely complicated and difficult task. However, continuing research by Yahr, now with Duke University in North Carolina, revealed several important factors influencing the



growth and habitat preferences of the species, and she has suggested new techniques that may yet help to reestablish the lichen populations at Eglin AFB. The Air Force and U.S. Fish and Wildlife Service consider this reintroduction project an important element in the long term recovery of *Cladonia perforata* in northwest Florida. We are hopeful that the most recent project will reestablish two populations of *Cladonia perforata* to replace those lost to habitat damage during Hurricane Opal.

The remnants of the original larger population of *Cladonia perforata* appear to be doing well 5 years after Hurricane Opal. Impacts from the storm opened up sandy areas that are suitable for recolonization by the species. The area where the surviving population exists is accessible to the public, and we are emphasizing the development of new management techniques for improved protection of the species. The upcoming 2001 Eglin Integrated Natural Resource Management Plan will provide direction for *Cladonia perforata* site protection, monitoring protocols, and public education. This increased emphasis on protection should reduce human impacts on the species.

The Air Force's careful attention to *Cladonia perforata* highlights many elements of a successful endangered species program. After documenting the species through a comprehensive biological inventory, the Air Force's partnerships with scientific organizations, regulatory agencies, and individual researchers helped it to meet its responsibilities under the Endangered Species Act without interfering with its primary military mission. The Air Force is committed to meeting both the spirit and the intent of the act. Reconciling conservation and military requirements can be challenging, and the Air Force's experience with this endangered lichen demonstrates the importance of working cooperatively with the Service and other interested parties.

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